The invention in which an exclusive right is claimed is defined by the following:

ELECTED 1. An ultrasound applicator that is capable of both ultrasound imaging and administering ultrasound therapy to a site, comprising:

(a) a plurality of ultrasound transducer elements configured in an array and mounted in a housing;

(b) a plurality of conductors adapted to couple a control system to the plurality of ultrasound transducer elements, for conveying signals that energize the plurality of ultrasound transducer elements in one of an imaging mode and a therapy mode; and

(c) a quality factor circuit adapted to couple to the control system and connected to the plurality of ultrasound transducer elements, said quality factor circuit including a switch that is selectively actuated to vary a quality factor associated with the plurality of ultrasound transducer elements based upon whether the plurality of ultrasound transducer elements are operated in the imaging mode or the therapy mode.

ELECTED 2. The ultrasound applicator of Claim 1, wherein the plurality of ultrasound transducer elements are configured in a concave array.

ELECTED 3. The ultrasound applicator of Claim 1, wherein each of the plurality of ultrasound transducer elements comprises a composite mixture that includes a piezo-ceramic, an adhesive binder, and thermally conductive particles.

ELECTED 4. The ultrasound applicator of Claim 2, wherein a focal point of the plurality of ultrasound transducer elements is determined by phase differences of the signals applied to energize the plurality of ultrasound transducer elements, said phase differences being controlled to achieve a desired focal point.

ELECTED 5. The ultrasound applicator of Claim 2, wherein an ultrasound beam produced by the plurality of ultrasound transducer elements is steered in a desired direction based upon phase differences in the signals applied to energize the plurality of ultrasound transducer elements.

ELECTED 6. The ultrasound applicator of Claim 2, wherein the plurality of ultrasound transducer elements comprise a flexible array mounted

within the housing so that a radius of curvature of the flexible array is selectively variable to control a focal point of the flexible array.

ELECTED 7. The ultrasound applicator of Claim 6, further comprising a movable shaft that is coupled to one end of the flexible array, said movable shaft being moved to vary the radius of curvature of the flexible array.

ELECTED 8. The ultrasound applicator of Claim 6, further comprising a prime mover that is drivingly coupled to the movable shaft, said prime mover being selectively energized to move the movable shaft and thereby vary the radius of curvature of the flexible array and thus, vary the focal point of the flexible array.

ELECTED 9. The ultrasound applicator of Claim 2, wherein the plurality of ultrasound transducer elements comprise a flexible array mounted within the housing, further comprising a movable link coupled to one end of the flexible array, said movable link being movable to control a curvature shape of the flexible array and thereby to control a direction in which an ultrasound beam is emitted by the flexible array.

ELECTED 10. The ultrasound applicator of Claim 9, further comprising a limit that controls and limits the curvature shape assumed by the flexible array as the movable link is moved.

ELECTED 11. The ultrasound applicator of Claim 1, further comprising a carriage supporting the plurality of ultrasound transducer elements and rotatably mounted within the housing, said carriage being rotated to control a direction of an ultrasound beam emitted by the plurality of ultrasound transducer elements.

ELECTED 12. The ultrasound applicator of Claim 11, wherein the carriage is translatable along a longitudinal axis of the ultrasound applicator to control a longitudinal disposition of the plurality of ultrasound transducer elements and to control a corresponding position of a focal point of an ultrasound beam emitted by the plurality of ultrasound transducer elements.

ELECTED 13. The ultrasound applicator of Claim 2, wherein the plurality of ultrasound transducer elements comprise a flexible array mounted within the housing, further comprising a plurality of movable pins that abut

against a back surface of the flexible array, each of said plurality of movable pins being positionable to define a curvature of the flexible array that produces a desired focal point for an ultrasound beam emitted by the flexible array.

ELECTED 14. The ultrasound applicator of Claim 13, further comprising a key having surfaces that act on the plurality of movable pins to define a desired curvature of the flexible array.

ELECTED 15. The ultrasound applicator of Claim 13, wherein the key includes surfaces that act on the plurality of movable pins, said key being movable to vary a curvature of the flexible array by changing positions of the plurality of pins that act on the flexible array by changing a position of the surfaces in contact with the plurality of pins.

ELECTED 16. The ultrasound applicator of Claim 13, further comprising a plurality of prime movers, each of which are coupled to a different one of the plurality of pins, said plurality of prime movers being selectively energized to position each of said plurality of pins so as to achieve a desired curvature of the flexible array.

ELECTED 17. The ultrasound applicator of Claim 2, wherein each of the plurality of ultrasound transducer elements is separately energized, and wherein each of the ultrasound transducer elements is mounted on a separate pivot axis so as to be controllably rotated about the pivot axis, further comprising a mechanical linkage that pivots the ultrasound transducer elements to control at least one of a focal point and a direction in which ultrasound energy they emit is directed.

ELECTED 18. The ultrasound applicator of Claim 2, wherein the plurality of ultrasound transducer elements are mounted to a thermally and electrically conductive layer and are spaced apart from each other by a kerf, further comprising an outer impedance matching layer overlying the thermally and electrically conductive layer.

ELECTED 19. The ultrasound applicator of Claim 18, wherein the plurality of ultrasound transducer elements comprise a flexible array, said thermally and electrically conductive layer and said outer impedance matching layer being generally elastic and thus able to bend without damage, and said kerfs

being filled with a deformable material that readily expands and contracts during bending of the flexible array.

ELECTED 20. The ultrasound applicator of Claim 18, further comprising a plurality of grooves formed in a surface of the thermally and electrically conductive layer, generally extending in alignment with the kerfs, said thermally and electrically conductive layer being bonded to the outer layer.

ELECTED 21. The ultrasound applicator of Claim 18, wherein the thermally and electrically conductive layer includes a ground electrode for each of the ultrasound transducer elements and conducts heat away from the ultrasound transducer elements.

22. A method for selectively employing an ultrasound transducer for ultrasound imaging and for administering ultrasound therapy, comprising the steps of:

(a) selectively energizing the ultrasound transducer in one of an imaging mode and a therapy mode;

(b) while energizing the ultrasound transducer in the imaging mode, selectively reducing a quality factor associated with the ultrasound transducer; and

(c) while energizing the ultrasound transducer in the therapy mode, enabling a substantially greater quality factor to be associated with the ultrasound transducer, than when operating in the imaging mode.

23. The method of Claim 22, wherein the step of selectively reducing the quality factor comprises the step of actuating a switch that causes a resistance to be coupled in parallel with the ultrasound transducer.

24. The method of Claim 22, wherein the step of selectively reducing the quality factor comprises the step of coupling the ultrasound transducer to an imaging damping network, while the step of enabling the substantially higher quality factor comprises the step of coupling a therapy damping network to the ultrasound transducer.

25. The method of Claim 22, further comprising the step of repeating steps (a) – (c) together for each of a plurality of ultrasound transducer elements comprising an ultrasound applicator, while the ultrasound applicator is inserted

inside a patient's body to successively image and administer ultrasound therapy to an internal site within the patient's body.

26. The method of Claim 25, further comprising the step of interrupting administration of ultrasound therapy in order to image the internal site to determine a status of the internal site and to evaluate a progress of the ultrasound therapy.

27. A flexible ultrasound transducer comprising:

(a) a thermally and electrically conductive layer;

(b) a plurality of ultrasound transducer elements supported by the thermally and electrically conductive layer, in a spaced-apart array, adjacent ultrasound transducer elements in the array being separated by a kerf that is filled with a deformable material that readily expands and contracts without being damaged during bending of the array;

(c) an outer impedance matching layer disposed over an outer surface of the thermally and electrically conductive layer; and

(d) a plurality of electrodes disposed on an opposite end of each of the plurality of ultrasound transducer elements from that supported by the thermally and electrically conductive layer, said plurality of ultrasound transducer elements being energized by a signal applied between the plurality of electrodes and the thermally and electrically conductive layer, said flexible ultrasound transducer being bendable to a desired radius of curvature to achieve a desired focal point for the flexible transducer.

28. The flexible ultrasound transducer of Claim 27, further comprising a housing in which the flexible array is mounted.

29. The flexible ultrasound transducer of Claim 27, wherein each of the plurality of ultrasound transducer elements comprises a composite mixture that includes a piezo-ceramic, an adhesive binder, and thermally conductive particles.

30. The flexible ultrasound transducer of Claim 27, further comprising a movable shaft attached to one end of the array, said movable shaft being movable to change a spacing between opposite ends of the array and thereby to achieve the desired radius of curvature, and thereby to achieve the desired focal point.

31. The flexible ultrasound transducer of Claim 30, further comprising a prime mover that is coupled to drivingly move the shaft when the prime mover

is selectively energized, said prime mover being energized to move the movable shaft to achieve the desired radius of curvature and the desired focal point.

32. The flexible ultrasound transducer of Claim 27, further comprising a carriage on which the array is supported, said carriage being movable to control a direction in which an ultrasound beam emitted by the plurality of ultrasound transducer elements is directed.

33. The flexible ultrasound transducer of Claim 32, wherein the carriage is coupled to a movable shaft that is moved to move the carriage.

34. The flexible ultrasound transducer of Claim 33, wherein the shaft is coupled to a prime mover that is selectively energized to move the carriage, and thereby, to move the array.

35. The flexible ultrasound transducer of Claim 33, wherein the carriage is translatable along a longitudinal axis of the carriage to move the array longitudinally.

36. The flexible ultrasound transducer of Claim 27, further comprising a solenoid and a support rod coupled to the array and selectively actuated by said solenoid to achieve the desired radius of curvature and the desired focal point for the array by changing a spacing between opposite ends of the array.

37. The flexible ultrasound transducer of Claim 27, further comprising a movable link attached to the array, said movable link being movable to change a curvature shape and orientation of the array and thereby to steer an ultrasound beam emitted by the array in a desired direction.

38. The flexible ultrasound transducer of Claim 27, further comprising a limit stop that abuts against a back of the array to control a curvature shape of the array.

39. The flexible ultrasound transducer of Claim 27, further comprising a plurality of pins that act against a back of the array to define a curvature shape of the array.

40. The flexible ultrasound transducer of Claim 39, wherein the pins are movable to vary the curvature shape of the array and thus, to control a focus point of the array.

41. The flexible ultrasound transducer of Claim 40, further comprising a key having a plurality of surfaces that act upon the plurality of pins to define the curvature of the array and thus, the focal point of the array.

42. The flexible ultrasound transducer of Claim 41, wherein the plurality of surfaces of the key are cam shaped and wherein the key is adapted to vary the position of the pins and thereby, to vary the focus of the array as the key is moved.

43. A method for selectively controlling at least one of a direction in which an ultrasound beam is emitted by an ultrasound transducer and a focus point of the ultrasound transducer, comprising the steps of:

(a) providing a flexible transducer array that includes a plurality of ultrasound transducer elements supported on a flexible layer;

(b) energizing the plurality of ultrasound transducer elements so that they emit an ultrasound beam; and

(c) enabling a user to selectively cause the flexible transducer array to bend so that the flexible transducer array assumes a curvature that achieves at least one of a desired direction and a desired focal point for the ultrasound beam emitted by the plurality of ultrasound transducer elements.

44. An ultrasound transducer that emits an ultrasound beam in at least one of a desired direction and at a desired focal point, comprising:

(a) a plurality of separate ultrasound transducer elements that are pivotally mounted in a spaced-apart array; and

(b) a plurality of actuators coupled to the plurality of ultrasound transducer elements and adapted to selectively rotate the plurality of separate ultrasound transducer elements about an axis of each, thereby orienting each of the plurality of separate ultrasound transducer element so that it is directed in a desired direction, and so that when energized, the plurality of separate ultrasound transducer elements collectively emit an ultrasound beam in at least one of a desired direction and a desired focal point.

45. The ultrasound transducer of Claim 44, wherein each of the plurality of actuators includes a prime mover and a linkage coupled to one of the plurality of separate ultrasound transducer elements.

46. The ultrasound transducer of Claim 44, further comprising a housing in which the plurality of separate ultrasound transducer elements are disposed.

47. The ultrasound transducer of Claim 44, further comprising a plurality of leads separately coupled to each of the plurality of separate ultrasound transducer elements to provide a driving signal thereto.

48. The ultrasound transducer of Claim 44, wherein each of the plurality of separate ultrasound transducer elements comprises a composite mixture that includes a piezo ceramic, an adhesive binder, and thermally conductive particles.

49. A method of mechanically controlling at least one of a desired direction and at a desired focal point of an ultrasound beam emitted by a plurality of separate ultrasound transducer elements, comprising the steps of:

(a) providing a plurality of separate ultrasound transducer elements that are pivotally mounted to rotate when actuated by a linkage;

(b) actuating the plurality of separate ultrasound transducer elements so that each emit an ultrasound signal; and

(c) selectively rotating the plurality of separate ultrasound transducer elements about their respective axes so that the ultrasound signals they produce are combined in an ultrasound beam that is directed in at least one of a desired direction and at a desired focus.

ELECTED 50. An ultrasound applicator that is capable of both ultrasound imaging and administering ultrasound therapy to a site, comprising:

(a) a ultrasound transducer mounted in a housing;

(b) a plurality of conductors adapted to couple a control system to the ultrasound transducer, for conveying signals that energize the ultrasound transducer in one of an imaging mode and a therapy mode; and

(c) a quality factor circuit adapted to couple to the control system and connected to the ultrasound transducer, said quality factor circuit including a switch that is selectively actuated to vary a quality factor associated with the ultrasound transducer based upon whether the ultrasound transducer is operated in the imaging mode or the therapy mode.

ELECTED 51. The ultrasound applicator of Claim 50, wherein the ultrasound transducer is configured in a concave curved shape.

ELECTED 52. The ultrasound applicator of Claim 50, wherein the ultrasound transducer comprises a composite mixture that is flexible and includes a piezo-ceramic, an adhesive binder, and thermally conductive particles.

ELECTED 53. The ultrasound applicator of Claim 52, wherein the ultrasound transducer is mounted within the housing so that a radius of curvature of the ultrasound transducer is selectively variable to control a focal point of ultrasound transducer.

ELECTED 54. The ultrasound applicator of Claim 53, further comprising a movable shaft that is coupled to one end of the ultrasound transducer, said movable shaft being moved to vary the radius of curvature of the ultrasound transducer.

ELECTED 55. The ultrasound applicator of Claim 54, further comprising a prime mover that is drivingly coupled to the movable shaft, said prime mover being selectively energized to move the movable shaft and thereby vary the radius of curvature of the ultrasound transducer and thus, vary the focal point of the ultrasound transducer.

ELECTED 56. The ultrasound applicator of Claim 53, further comprising a movable link coupled to one end of the ultrasound transducer, said movable link being movable to control a curvature shape of the ultrasound transducer and thereby, to control a direction in which an ultrasound beam is emitted.

ELECTED 57. The ultrasound applicator of Claim 56, further comprising a limit that controls and limits the curvature shape assumed by the ultrasound transducer as the movable link is moved.

ELECTED 58. The ultrasound applicator of Claim 50, further comprising a carriage supporting the ultrasound transducer and rotatably mounted within the housing, said carriage being rotated to control a direction of an ultrasound beam emitted by the ultrasound transducer.

ELECTED 59. The ultrasound applicator of Claim 58, wherein the carriage is translatable along a longitudinal axis of the ultrasound applicator to control a longitudinal disposition of the ultrasound transducer and to control a

corresponding position of a focal point of an ultrasound beam emitted by the ultrasound transducer.

ELECTED 60. The ultrasound applicator of Claim 53, further comprising a plurality of movable pins that abut against a back surface of the ultrasound transducer, each of said plurality of movable pins being positionable to define a curvature of the ultrasound transducer that produces a desired focal point for an ultrasound beam emitted thereby.